THURSDAY, NOVEMBER 26, 1903.

RECENT BOOKS ON NATURAL HISTORY.

Turner on Birds. A Short and Succinct History of the Principal Birds Noticed by Pliny and Aristotle. First published by Doctor William Turner, 1544. Edited, with Introduction, Translation, Notes, and Appendix, by A. H. Evans, M.A. Pp. xviii+223. (Cambridge: At the University Press, 1903.) Price 6*s.* net.

Among the Waterfowl. (The Dainty Nature Series.) By Herbert K. Job. Pp. xxi + 224; illustrated. (London: Wm. Heinemann, 1903.) Price 5*s.* net.

Nature Biographies. (The Dainty Nature Series.) By Clarence Moores Weed. Pp. x+164; illustrated. (London: Wm. Heinemann, 1903.) Price 5*s.* net.

The Brook Book. (The Dainty Nature Series.) By Mary Rogers Miller. Pp. xvi+241; illustrated. (London: Wm. Heinemann, 1903.) Price 5*s.* net.

The Waterfowl Family. By L. C. Stanford, L. B. Bishop, and T. S. Van Dyke. Pp. x+598; illustrated. (New York: the Macmillan Company; London: Macmillan and Co., Ltd., 1903.) Price 8*s.* 6*d.* net.

Handbook of Nature Study. For Teachers and Pupils in Elementary Schools. By D. Lange. Pp. xvi + 329; illustrated. (New York: the Macmillan Company; London: Macmillan and Co., Ltd., 1901.)

WILLIAM TURNER, whose strong religious opinions entailed for him a life of many vicissitudes in the days of Henry VIII. and his three successors, had also the makings of a good ornithologist. In his voluntary and enforced absences from England (during which he visited many European countries, and formed a friendship with Conrad Gesner), as well as in his travels in this country, he gained a knowledge of the appearance and habits of many birds which might have enabled him to write a book on the subject which would have been of surpassing interest at the present day. But, like some modern ornithologists, he was more concerned in finding out (often with doubtful success) to what species of birds certain names used by certain ancient authors really applied. So that when in 1544 he published his work on ornithology, his object was primarily to determine the principal kinds of birds named by Aristotle and Pliny.

Fortunately, however, Turner could not wholly restrain his natural bent for original observation, and here and there he added notes from his own experience, some of which form priceless items in the history of the birds of this country. In so doing (as the editor remarks) he produced the first book on birds which treats them in anything like a modern scientific spirit. He usually tells us whether he observed the various species in England or abroad, and thus Turner may fairly be called the father of British ornithology. To him we owe our knowledge of the fact that the crane bred in English fens, while his account of the abundance and audacity of the kite in his day reminds us how easy it would be to increase the remnant of these birds left to us by merely letting them alone. On the other hand, he tells us that the stork was nowhere to be seen in our island. He gives a sufficient answer to those extreme bird-protectionists who contend that the hoopoe was once abundant here and has been exterminated, for he knew the bird well, and states roundly that nowhere in the whole of Britain is the upupa to be found. His knowledge of the habits of various birds, such as the hobby, harrier, dipper, peewit, black tern and grey shrike (which he had seen not oftener than twice in England, though most frequently in Germany) is remarkable.

Turner's treatise has long been a great rarity, and ornithologists are much indebted to the editor and to the Syndics of the Cambridge University Press for making this early bird-book generally accessible.

In an appendix some extracts from a work by John Caius (1570) are added, which show that Caius was a good observer. It is interesting to note that the great rook controversy was precisely in the same condition in the sixteenth century as it is now, and that young rooks were even then appreciated.

The binding, printing, and illustrating of the "Dainty Nature Series" justify its title, although the highly-glazed paper rendered necessary for the reproduction of the numerous photographic illustrations makes the volumes very heavy to hold. Mr. Job relates his personal observations during five-and-twenty years in pursuit (chiefly with a camera) of the ducks, geese, grebes, divers, gulls, petrels, and other seafowl found in the northern and middle States and in Lower Canada, east of the Rocky Mountains. His charming work contains more new and original notes on these birds (both while at their breeding stations and in their less known winter haunts far from the shore) than any other book of this kind we have had the pleasure of reading. The illustrations are in advance of anything else of this kind we have seen. With photographs of nests and eggs we are now familiar. The present series is beautifully done, those of the ducks showing even the pattern of the "down." But it gives us a far better idea of the breeding habits of these birds when we have a view of a huge marshy sheet of water in the Magdalen Islands, where wildfowl breed in crowds; and a bit of a "slough," showing the identical clump of rushes which hides a canvas-back duck's nest, really tells us more of the bird's life-history than a picture of the actual nest and eggs. Again, the author has obtained pictures at close quarters of gulls, guillemots, &c., on or alighting at their nests. As examples of what may be found in these fascinating pages, we may point to the pictures of the great northern diver's floating nests with the surrounding scenery, grebes swimming about near their nests, a Franklin's gull eating the eggs of the eared grebe in the nest, the owner watching, shearwaters at sea fighting over cod livers thrown to them, and a petrel characteristically "walking on the water." No field ornithologist should be without this interesting book.

In "Nature Biographies" the lives of some everyday American butterflies, moths, grasshoppers, and flies are told and depicted in a delightful manner, the camera having been used most successfully in many ways; for instance, in showing the gradual develop-

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ment of a butterfly emerging from the chrysalis, caterpillars feeding, the webs or tents woven and leaves curled up by caterpillars for their protection, and various insects in natural attitudes. We hardly think that "mourning-cloak butterfly" (under which name the life-history of this butterfly is ably dealt with) is any more happy than Camberwell Beauty. To read this dainty volume is to get a fair knowledge of the elements of entomology in a very pleasant way.

"The Brook Book," on lighter paper than the two volumes of this series just noticed, consists of a number of chapters describing the plants and live creatures to be met with in rambles along the banks (and in the bed) of brooks. Some of them relate the doings of a college walking party which explored their neighbourhood, and the occasional introduction of a professor or a "visiting geologist" leads to informing chapters, while the adventures of the members themselves add a vein of humour. It is impossible even to state the wide range of subjects so pleasantly dealt with, but they cover the settings and occupants of various kinds of brooks; and the enthusiasm of the writer and her pleasant way of introducing the subjects make the book just the thing to read aloud to elder children, and to instruct oneself with at the same time. The sixteen half-tone plates of brook scenery are very beautiful, and there are nearly seventy line engravings in the text.

We have in a volume of the American Sportsman's Library a capital guide to the waterfowl of North America, at once readable and scientific, and useful alike to the naturalist and the sportsman. Introductory chapters treating of the structure, character of the plumage, migrations, and the use as food and ornament of these groups, and of the necessity of affording them protection in spring, are followed by descriptions of the chief stations for wildfowling and of the various modes of shooting ducks and shore-birds. These chapters are written in the graphic language of an enthusiastic and thorough "workman." The details of actual shooting days and nights, with exciting and amusing incidents, written with a certain amount of expressive "western" words, will appeal strongly to all who have felt the glamour which hangs about "wildfowl." The body of the book is taken up with a scientific description of each species, giving details of the different stages of plumage at all ages and seasons, measurements, eggs, and habitat, followed by a general account of the habits. The waterfowl of the Pacific coast are separately dealt with, and the book closes with diagnoses of the families and genera. It is beautifully, though not profusely, illustrated, and the letterpress is printed on nice light paper, which makes this pleasing volume not too heavy to be held comfortably, despite its six hundred pages.

The object of Mr. Lange's handy volume is to point out to teachers some of the material which may be made the basis of profitable lessons in nature-study, and he has endeavoured to show how this material may be made available, and what the pupils may be taught about it. The plan here advocated is to take the children out into the fields and woods and to show them, and let them examine, various natural objects, or to bring before them prepared and preserved objects and to instruct them in these. The teacher is told how best to do this. The book, indeed, consists of a series of lessons on various natural objects, in which the requisite information is given, and the teacher is told what material is necessary and how to obtain and use it. The author has been successful in producing a valuable manual of work for children whose school years close with the common school course. The numerous woodcuts are useful and to the purpose. Unfortunately for English readers the country for which the book is especially designed is the eastern States of North America. O. V. APLIN.

THE NATURE OF ELECTRICITY AND THE CONSTITUTION OF MATTER.

Conduction of Electricity through Gases. By J. J. Thomson, D.Sc., LL.D., Ph.D., F.R.S. Pp. vi + 566. (Cambridge: University Press, 1903.) Price 16*s*.

THIS book on the newest branch of physics, from the pen of its originator and chief exponent, deals with one of the most rapid and remarkable developments of modern scientific research. The "ionisation theory of gaseous conduction," it is claimed in the preface, not only gives a simple and direct explanation of the electrical properties of gases, but also affords the means of subjecting the fundamental problems of the nature of electricity and the constitution of matter to direct experimental attack. The reason is very clearly set forth.

> "The possession of a charge by the ions increases so much the ease with which they can be traced and their properties studied that as the reader will see we know far more about the ion than about the uncharged molecule."

There is food for reflection for both the man of science and the philosopher in this comprehensive remark. Less than a decade ago the possibility of the existence of a gaseous ion was hardly recognised. To-day this volume of very respectable dimensions testifies to the wealth of researches that have followed the inception of Prof. Thomson's theory. The researches of the author and his former pupils, Rutherford, Townsend, C. T. R. Wilson, Zeleny, Strutt, H. A. Wilson, Langevin and many others are brought together in this book and correlated with older researches and with those that have been proceeding simultaneously elsewhere.

In the two opening chapters the fundamental position is developed that the charge carried by the gaseous ion is the same for the ions of all gases, is independent of the ionising agency, and is equal to that carried by the hydrogen ion in electrolysis. This conclusion is arrived at from considerations of the diffusion velocity of the ions, and their velocity in an electric field, and needs only the assumption that the ions behave like the particles of a perfect gas towards pressure.

A second and completely independent determination of e for the same kind of ions is made possible by the application of the condensation experiments of C. T. R.

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